

**ABSTRACT**

Systems and methods of fabricating a U-shaped memory device with a recessed channel and a segmented/separated ONO layer are provided. Multibit operation is  
5 facilitated by a separated ONO layer, which includes a charge trapping region on  
sidewalls of polysilicon gate structures adjacent to source/drain regions. Programming  
and erasing of the memory cells is facilitated by the relatively short distance between  
acting source regions and the gate. Additionally, short channel effects are mitigated by a  
relatively long U-shaped channel region that travels around the recessed polysilicon gate  
10 thereby adding a depth dimension to the channel length.